Project Introduction

SIFT proposes to design and develop the Marshal system, a mixed-initiative tool for maintaining task models over the course of evolving missions. SIFT will demonstrate Marshal by developing it as a plugin for the TRACLabs PRIDE procedure authoring system. A Marshal-enabled PRIDE will learn and maintain task models so that it can improve the consistency and correctness of PRL-based procedures. Marshal will monitor procedures as they are authored in PRIDE, learning organizational conventions and commonly applied constraints. Marshal will enhance the PRIDE interface with dialogue elements that highlight potential errors and unconventional elements in the current procedure. Marshal will allow model drift by adapting its model of procedures over time and it will accommodate incomplete and inconsistent feedback from procedure authors. Marshal's capabilities will stem from how it represents and reasons with a family of possible procedure model interpretations. As authors use different procedure constructs, Marshal will create interpretations of constraints that match the constructs. With author feedback, Marshal will update the interpretations to more closely match the corpus of procedures authored by the organization. With a family of model interpretations, Marshal can compute the expectation that user procedures are correct and consistent. Marshal also computes diagnoses explaining which assumptions about the user's intended model lead to inconsistency. From the diagnoses, Marshal populates a queue of potential plan flaws that the author can address at their convenience through natural and informative dialogues. As users interact with Marshal, it automatically maintains procedure models so that they can better serve procedure authors as missions evolve.

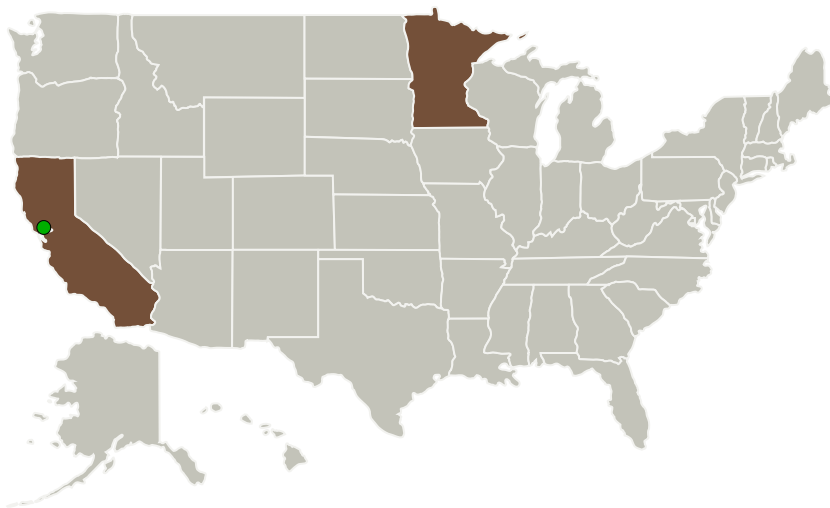## Primary U.S. Work Locations and Key Partners

Marshal: Maintaining Evolving Models, Phase II

Table of Contents

Organizations Performing Work	Role	Type	Location
SIFT, LLC	Lead Organization	Industry	Minneapolis, Minnesota
🟢Ames Research Center(ARC)	Supporting Organization	NASA Center	Moffett Field, California

Primary U.S. Work Locations	
California	Minnesota

Images
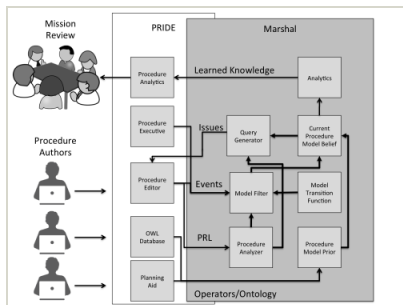
Briefing Chart
Marshal: Maintaining Evolving Models Briefing Chart
(https://techport.nasa.gov/image/135809)

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
SIFT, LLC

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

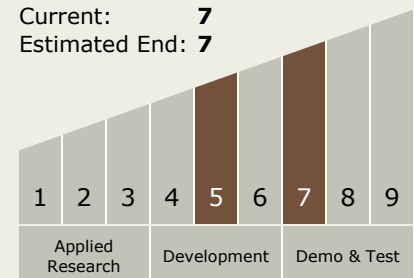**Program Director:**
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Daniel Bryce

Technology Maturity (TRL)

Start: **5**
Current: **7**
Estimated End: **7**

1	2	3	4	5	6	7	8	9
Applied Research			Development			Demo & Test		

Technology Areas

Primary:

- TX11 Software, Modeling, Simulation, and Information Processing
  └ TX11.1 Software Development, Engineering, and Integrity
    └ TX11.1.7 Frameworks, Languages, Tools, and Standards

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System